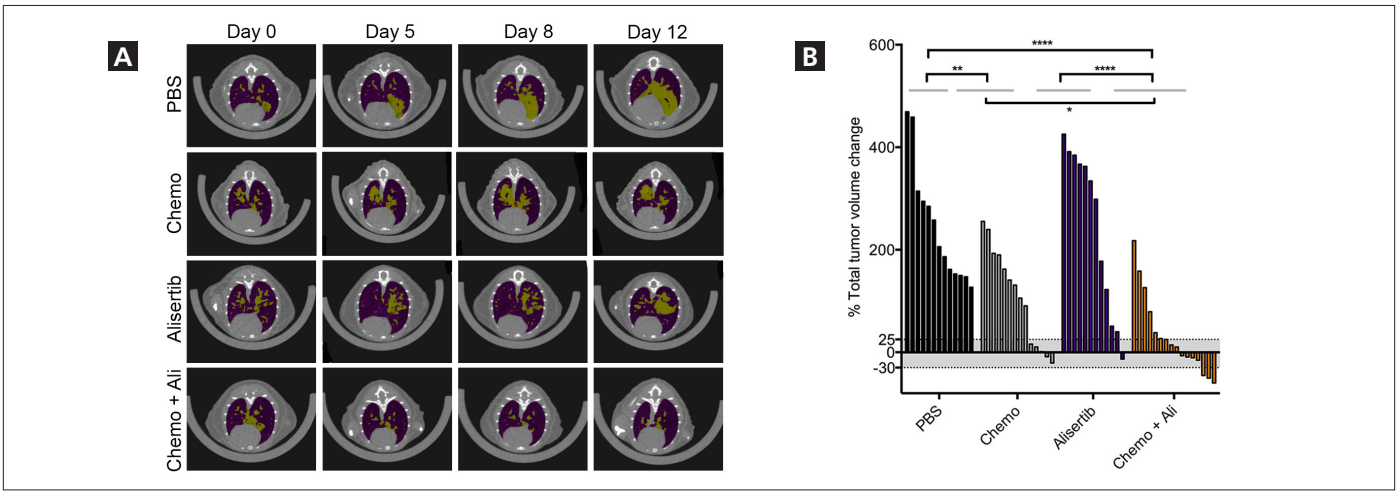

Figure 1. MicroCT imaging results for each treatment group on Day 0, 5, 8 and 12 are shown in Figure 1A. SCLC tumors and normal lung and airway are shown in yellow and purple, respectively. The waterfall plot (Figure 1B) shows the total percentage change in tumor volume from day 0-19 in each RPM mouse from each respective treatment group (for three cycles of chemotherapy). Gray shading on the graph indicates partial response and stable disease. P values were calculated with two-tailed unpaired t tests ($p < * 0.023, ** < 0.002, **** < 0.0001$)[3].

The Outcome

Using microCT imaging, researchers in Dr. Oliver's laboratory were able to quantify MYC-driven SCLC progression *in vivo* and throughout the course of treatment. They compared the rates of tumor progression in GEMM tumors treated with Alisertib to those receiving standard SCLC chemotherapy regimens alone. Dr. Oliver and colleagues found that mice treated with the combination of cisplatin, etoposide, plus Alisertib exhibited the greatest reduction in tumor growth compared to the other treatment protocols[3]. Importantly, a subsequent Phase II clinical trial validated these findings, demonstrating that patients with MYC-driven SCLC treated with Alisertib plus chemotherapy as second-line therapy had a greater progression-free survival compared to those treated with chemotherapy alone[5]. Dr. Oliver and her team will continue to use microCT imaging and GEM models to further elucidate key features of human SCLC and test potential treatments for MYC-driven SCLC in an effort to identify a more effective therapy for these patients.

The Future of MicroCT Imaging for Lung Cancer Research

Dr. Oliver envisages that the Quantum microCT will ultimately transform how lung cancer is quantified as it is possible to extract functional imaging parameters e.g. Functional Residual Capacity or Tidal Volume measurements using respiratory-gated scanning techniques to quantify disease states.

Conclusion

MicroCT imaging has traditionally been used for bone imaging due to its high density. However, because of the density changes between lung tissue (comprised of mostly air) and tumor, it offers superior image contrast for a variety of pulmonary applications. As seen in this case study, Dr. Oliver and her team demonstrated how the Quantum microCT system easily quantified treatment effects of various therapies in MYC-driven SCLC.

MicroCT imaging with the Quantum GX2 offers:

- High resolution, high speed scanning
- Low dose imaging ideal for longitudinal studies
- Functional imaging using respiratory-gated scanning eliminates motion-induced artifacts and allows accurate quantification over time, making 4D imaging possible

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